What is claimed is:

1. A relevant document display apparatus for displaying a group of documents containing documents to be cross-referenced, comprising:

a document group analysis device for classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents, and for extracting information about classification as document group information;

a document group keyword extraction device for extracting a keyword contained in a document forming part of each group of documents by referring to the document group information; and

a document group keyword display device for displaying a title relevant to each group of documents and a corresponding keyword extracted from the group of documents by said document group keyword extraction device.

2. The apparatus according to claim 1, wherein said document group keyword device displays with enhancement a group of documents containing a document

10

5

15

20

10

15

20

specified by a user for retrieval, or a keyword specified for retrieval.

3. A relevant document display apparatus for displaying a group of documents containing documents to be cross-referenced, comprising:

a document group analysis device for classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents, and for extracting information about classification as document group information;

a document attribute analysis device for extracting document attribute information about an attribute of each document from a plurality of documents forming the set of documents; and

a document group structure display device for displaying cross-references in each group of documents in a tree structure in which the document attribute information or abbreviated information for each document forming part of the group of documents is displayed as each node by referring to the document group information and the document attribute information.

4. The apparatus according to claim 3, wherein said document group structure display device displays the cross-references in each group of documents in a tree structure in which a combination of an abbreviated name of an author and amount-of-document information for each document forming part of the group of documents is displayed as each node by referring to the document group information and the document attribute information.

10

15

20

25

- 5. The apparatus according to claim 3, wherein said document group structure display device further displays a plurality of topics extracted from a document contained in each group of documents as associated with each node forming part of the tree structure displayed for the group of documents.
- 6. The apparatus according to claim 5, wherein said document group structure display device displays each topic and a relevant node in a same color for each group of documents.
- 7. The apparatus according to claim 3, wherein said document group structure display device displays with enhancement a node corresponding to a

document specified by a user for retrieval.

8. A relevant document display apparatus for displaying a group of documents containing documents to be cross-referenced, comprising:

a document group analysis device for classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents, and for extracting information about classification as document group information;

a topic analysis device for further classifying each of the classified group of documents based on topics extracted from each document forming part of each group of documents, and extracting information about the further classification as topic classification information;

a topic keyword extraction device for extracting a keyword contained in a document relevant to each topic obtained by further classifying each of the groups of documents by referring to the document group information and the topic classification information; and

a topic keyword display device for displaying,

10

5

20

15

for each of the groups of documents and topics obtained by further classifying the groups of documents, a relevant title and a keyword extracted by said topic keyword extraction device and associated with each topic.

9. A relevant document display method for displaying a group of documents containing documents to be cross-referenced, comprising the steps of:

classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents;

extracting information about classification as document group information;

extracting a keyword contained in a document forming part of each group of documents by referring to the document group information; and

displaying a title relevant to each group of documents and a corresponding keyword extracted from the group of documents.

10. The method according to claim 9, further comprising the step of:

10

15

20

5

10

15

20

displaying with enhancement a group of documents containing a document specified by a user for retrieval, or a keyword specified for retrieval.

11. A relevant document display method for displaying a group of documents containing documents to be cross-referenced, comprising the steps of:

classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents;

extracting information about classification as document group information;

extracting document attribute information about an attribute of each document from a plurality of documents forming the set of documents; and

displaying cross-references in each group of documents in a tree structure in which the document attribute information or abbreviated information for each document forming part of the group of documents is displayed as each node by referring to the document group information and the document attribute information.

10

15

20

12. The method according to claim 11, further comprising the step of:

displaying the cross-references in each group of documents in a tree structure in which a combination of an abbreviated name of an author and amount-of-document information for each document forming part of the group of documents is displayed as each node by referring to the document group information and the document attribute information.

13. The method according to claim 11, further comprising the step of:

displaying a plurality of topics extracted from a document contained in each group of documents as associated with each node forming part of the tree structure displayed for the group of documents.

- 14. The method according to claim 13, further comprising the step of:
- displaying each topic and the relevant node in a same color for each group of documents.
 - 15. The method according to claim 11, further comprising the step of:
- displaying with enhancement a node corresponding

a group of documents containing documents to be cross-

to a document specified by a user for retrieval.

5

10

15

20

25

referenced, comprising the steps of: classifying a plurality of documents forming a set of documents into one or more group of documents

A relevant document display method for displaying

to be \cross-referenced by analyzing a reference

between the plurality of documents forming the set of

documents; extracting information about classification as

document group information;

further classifying each of the classified group of documents \ based on topics extracted from each document forming part of each group of documents, and the further information about extracting

classification as topic classification information;

extracting & keyword contained in a document relevant to each topic obtained by further classifying each of the groups \of documents by referring to the document group information and the topic classification information; and

displaying, for each of the groups of documents and topics obtained by further classifying the groups of documents, a relevant title and a keyword extracted in said topic keyword extracting step and associated with each topic.

17. A computer-readable storage medium used to direct a computer to perform the steps of:

classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of documents;

extracting information about classification as document group information;

extracting a keyword contained in a document forming part of each group of documents by referring to the document group information; and

displaying a title relevant to each group of documents and a corresponding keyword extracted from the group of documents.

20 18. A computer-readable storage medium used to direct a computer to perform the steps of:

classifying a plurality of documents forming a set of documents into one or more group of documents to be cross-referenced by analyzing a reference between the plurality of documents forming the set of

5

10

15

10

documents;

extracting information about classification as document group information;

extracting document attribute information about an attribute of each document from a plurality of documents forming the set of documents; and

displaying cross-references in each group of documents in a tree structure in which the document attribute information or abbreviated information for each document forming part of the group of documents is displayed as each node by referring to the document information document attribute and the information.

relevant document display apparatus 15 displaying a group of documents containing crossreferenced documents, comprising:

> contents estimation means for estimating contents of the group of \documents based on contents of a document and patterns of opinion input by authors from document database storing a group of crossreferenced documents, and for generating an index corresponding to a topic pattern of the estimated contents;

input means for imputting a retrieval request

25

corresponding to the document database from a user;
retrieval engine means for retrieving a document
in the document database; and

views generation means for generating one or more views using a retrieval result from said retrieval engine means and the index, switching the one or more views, and displaying the views on a display device.

20. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand an entire structure of reference among displayed documents by simply displaying a reference tree structure of displayed documents and information relating to a node corresponding to each document by grouping documents having an identical attribute in displayed documents.

21. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand an entire structure of reference among displayed documents by simply displaying a reference tree structure of displayed documents and information relating to a node corresponding to each document by selecting only a document containing a large number of references in the displayed documents

15

10

5

20

The apparatus according to claim 19, wherein

based on a size of a screen.

5

10

15

22\.

said view generation means allows a user to easly understand an entire structure of a retrieval result from a document database by simply displaying a reference tree structure of displayed documents and information relating to a node corresponding to each

document by selecting only a document containing a large number of references to documents containing a

user input keyword.

The apparatus according to claim 19, wherein 23. said view generation means allows a user to easily understand an entire structure of a retrieval from \a document database by displaying result reference among displayed documents with a topic pattern estimated about the documents by said contents estimation means.

20

25

The apparatus\according to claim 19, wherein 24. said view generation means allows a user to easily understand a retrieval result from a document database related to time information by displaying, in a calendar format, only documents in a specified

time period in displayed documents.

25. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand only an important portion of reference of documents in a document database by displaying at a high intensity level a specified topic pattern estimated by said contents estimation means.

26. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand a combination of a question and an answer corresponding to a question item by instructing said retrieval engine means to retrieve only a document corresponding to a question and an answer in a specified topic pattern estimated by said contents estimation means

27. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand only an important portion of reference of documents in a document database by displaying a specified author at a high intensity level based on a history of input opinions for each document in the document database and a specified

20

25

5

10

topic pattern estimated by said contents estimation means.

28. The apparatus according to claim 19, wherein said view generation means allows a user to easily understand reference among documents in a document database from an author's viewpoint by displaying as a directed graph an author of each document in the document database as a node, the reference among the documents as a link, and a time of reference as intensity of the link.

29. The apparatus according to claim 19, wherein a document stored in the document database is a message document of network news downloaded through a network.

30. A method of displaying a relevant document for displaying a group of documents containing cross-referenced documents, comprising the steps of:

estimating contents of the group of documents based on contents of a document and patterns of opinion input by authors from a document database storing a group of cross-referenced documents;

generating an index corresponding to a topic

15

10

5

20

pattern of the estimated contents;

\ inputting a retrieval request corresponding to the \document database from a user;

retrieving a document in the document database; and

generating one or more views using a retrieval result from said retrieval engine means and the index, switching the one or more views, and displaying the views on a display device.

31. A computer-readable storage medium used to direct a computer to perform the steps of:

estimating contents of the group of documents based on contents of a document and patterns of opinion input by authors from a document database storing a group of cross-referenced documents;

generating an index corresponding to a topic pattern of the estimated contents;

inputting a retrieval request corresponding to the document database from a user;

· retrieving a document in the document database; and

generating one or more views using a retrieval result from said retrieval engine means and the index, switching the one or more views, and displaying the

10

5

20

25

views on a display device.

USUFACES . USESSA